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than 0.015% in mass % as the contents of alloying elements with the rest consisting of Fe and unavoidable impurities and having a structure subjected to tempering after quench hardening or carbonitriding, wherein the hardness after said tempering is at least HRC 58, when tempered at a temperature in a range of 180°C to 350°C, and the maximum carbide size is not more than 8 μm .

REMARKS

Claims 1 and 2 are pending in this application. Claim 1 has been amended. Care has been exercised to avoid the introduction of new matter. Indeed, adequate descriptive support for the present Amendment should be apparent throughout the originally filed disclosure as, for example, Table I appearing at page 11 of the written description of the specification. Applicants submit that the present Amendment does not generate any new matter issue.

A clean copy of amended claim 1 appears in the Appendix hereto.

Claims 1 and 2 were rejected under 35 U.S.C. §103 for obviousness predicated upon Takata et al. in view Ochi et al., the acknowledged prior art and "High Carbon Chromium Bearing Steels" (JIS).

In the statement of the rejection, the Examiner concluded that one having ordinary skill in the art would have been motivated to incorporate nickel into the steel disclosed by Takata et al. in view of Ochi et al. The Examiner further concluded that one having ordinary skill in the art would have been motivated to heat treat the resulting steel at a elevated temperature in view of what the Examiner perceives as an admission on page 2

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of the written description of the specification, lines 7 through 12. Still not getting to the claimed invention, the Examiner concluded that the steel disclosed by Takata et al. is similar to that disclosed in JIS at page 1, Table II (SUJ2) and, hence, one having ordinary skill in the art would have expected the steel disclosed by Takata et al. to exhibit properties similar to those of SUJ2. The Examiner then concluded that the properties recited in the claims would be inherent after heat treatment. This rejection is traversed as factually and legally erroneous.

Lack of Facts

The obvious facts should be stated -none of the applied references to Takata et al., Ochi et al. or JIS(Table 2), SUJ2 relates to bearing steels designed for high temperature surface. Further, contrary to the Examiner's assertion, the SUJ2 steel is **not**, repeat **not**, similar to the steel disclosed by Takata et al., because the SUJ2 steel does not contain the amounts of copper, nickel or aluminum disclosed by Takata et al. In fact, JIS adds nothing to Takata et al., since Takata et al. state that the disclosed steel is a bearing steel. But that is not sufficient.

Thus, as a factual manner, none of the applied references to Takata et al., Ochi et al. or JIS discloses or suggests a bearing steel **designed for high temperature service**. How then does the Examiner get to the claimed invention?

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There is no Motivation

The Examiner is required to make a "thorough and searching" factual inquiry and, based upon that factual inquiry, explain **why** one having ordinary skill in the art would have been realistically impelled to combine applied references to arrive at a claimed invention. *In re Lee*, __F.3d__, 61 USPQ2d 1430, 1433 (Fed. Cir. 2002). The Examiner has not made that "thorough and searching" factual inquiry or cogently explained why one having ordinary skill in the art would somehow have realistically combined the applied references to arrive at the claimed invention. *In re Lee*, *supra*.

The Examiner has completely failed to provide any **factual basis** to support the assertion that one having ordinary skill in the art would have recognized that the steels disclosed by Takata et al. and Ochi et al. are bearing steels **designed for use at high temperatures**, i.e., exhibit a long life under high temperature conditions. Ergo, even if the steels disclosed by Takata et al. and Ochi et al. were intermixed, as though one having ordinary skill in the art would have arbitrarily mixed elements from hundreds of thousands of steel compositions, one having ordinary skill in the art would **still not have been realistically motivated** to heat treat that steel at elevated temperatures, as in the claimed invention. *In re Lee*, *supra*. Again, the Examiner has **not factually** established the realistic motivation to heat treat the steels of Takata et al. and Ochi et al. at an elevated temperature as is the claimed invention. Saying so does **not** make it so. *In re Lee*, *supra*.

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Applicants stress the recitation on page 2 of the written description of the specification, lines 7 through 12, does relate to high temperature bearing use. Applicants do not deny that there are known high temperature bearing steels. But not the steel of Takata et al. or the steel of Ochi et al. even if one having ordinary skill in the art would have cavalierly intermixed the alloying elements. The Examiner has not identified any **factual basis, as judicially required**, upon which to conclude that one having ordinary skill in the art, out in the real world, would have been realistically motivated to modify and then subject the steel disclosed by Takata et al. to a **high temperature tempering treatment** designed for high temperature bearings, as in the claimed invention. *In re Lee, supra.*

Additional Differences That Undermine The Obviousness Conclusion

One of the principle differences between the claimed invention and the steel disclosed by Takata et al. resides in the **nickel content**. Manifestly, as appreciated by the Examiner, Takata et al. does not require nickel. It should be noted that sample G of Takata et al. merely contains an impurity amount of nickel. As Takata et al. clearly regard nickel as an impurity, it can not be concluded that one having ordinary skill in the art would have been realistically led to proceed **against the teachings** of Takata et al. by incorporating nickel therein. In this respect, the Examiner's attention is invited to the relevant decisions of *In re Fritch*, 972 F.2d 1260, 23 USPQ2d 1780 (Fed. Cir. 1992); *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984); *In re Schulpen*, 390 F.2d 1009, 157 USPQ 52 (CCPA 1968).

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Moreover, it should be apparent from Tables 3 and 4 of the written description of the specification, that the rolling fatigue life and foreign matter rolling life at 200°C of steel Samples, M, NO, P, to which nickel is not added, are clearly **lower than** those of inventive Examples A through L, to which nickel is added. This effect is **dramatic and unexpected**, and **can not** be ignored. Indeed, the unexpected nature of such a dramatic effect is apparent as neither Takata et al. nor Ochi et al. disclose any steels which one having ordinary skill in the art would have recognized as a bearing steel designed for high temperature use.

The Examiner's Erroneous Reliance Upon Inherency

The Examiner committed clear legal error by falling back on an inherency theory in the context of the imposed under 35 U.S.C. §103 for obviousness. The Examiner's invocation of the doctrine of inherency appears to be that if the steel disclosed by Takata et al. is modified by incorporating nickel, and if, one having ordinary skill in the art would somehow have heat treated, even though no factual basis has been established to show that one having ordinary skill in the art would have recognized that the resultant steel is suitable for high temperature use, then the claimed invention would result. In other words, pick the right ingredients, heat at the right temperature, following the blueprint of the Applicants' disclosure, and the invention results. This approach is legally erroneous for at least two reasons.

Firstly, in order to invoke the doctrine of inherency, the Examiner must **factually** establish that the allegedly inherent properties necessarily, repeat necessarily flows from the teachings of the applied prior art and that one having ordinary skill in the art would

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have recognized such properties. *Crown Operations, International, Ltd. v. Solutia Inc.*, ___ F.3d ___, 62 USPQ2d 1917 (Fed. Cir. 2002); *Finnegan Corp. v. ITC*, 180 F.3d 1354, 51 USPQ2d 1001 (Fed. Cir. 1999); *In re Robertson*, 169 F.3d 743, 49 USPQ2d 1949 (Fed. Cir. 1999). Clearly, since each alloying element must be selected in order to achieve the properties recited in the claims, and the right heat treating temperature must be employed, it is legally erroneous to conclude that the recited properties would necessarily result from the teachings of the applied prior art and that such would have been recognized by one having ordinary skill in the art, as judicially required.

Moreover, the Examiner's agglomeration of "ifs" necessary to support the rejection underscores legal error. Specifically, the Examiner's approach that if the right amount of ingredients of the steel disclosed by Takata et al. are selected, and if nickel is added in the right amount, and then if one skilled in the art would have recognized that the resulting steel is suitable for high temperature use, and that has not been established by facts, and then if the fortuitously formulated steel is tempered at a high temperature, then maybe the claimed invention would result. This approach has been repeatedly judicially condemned as confusing obviousness with inherency. *In re Rijckaert*, 9 F.3d 1531, 28 USPQ2d 1955 (Fed. Cir. 1993); *In re Shetty*, 566 F.2d 81, 195 USPQ 753 (CCPA 1977); *In re Rinehart*, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); *In re Naylor*, 369 F.2d 765, 152 USPQ 106 (CCPA 1966); *In re Spormann*, 363 F.2d 444, 150 USPQ 449 (CCPA 1966); *In re Henderson*, 348 F.2d 550, 146 USPQ 372 (CCPA 1965).

Applicants would again refer to *Ex parte Schriker*, 56 USPQ2d 1723, 1725 (BPAI 2000); wherein the Honorable Board of Patent Appeals and Interferences stated:

Inherency and obviousness are somewhat like oil and water-
they do not mix well.

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Ergo, the Examiner's reliance upon the doctrine of inherency is **legally erroneous**.

Evidence of Nonobviousness

It is **legally erroneous** to ignore, as the Examiner has done, any evidence impacting **nonobviousness**. *Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 5 USPQ2d 1434 (Fed. Cir. 1988); *Stratoflex Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 218 USPQ 871 (Fed. Cir. 1983); *In re Murch*, 464 F.2d 1051, 175 USPQ 89 (CCPA 1972). That goes for evidence in the specification. *In re Glaug*, ___F.3d___, 61 USPQ2d 1151 (Fed. Cir. 2002); *In re Soni*, 54 F.3d 746, 34 USPQ2d 1685 (Fed. Cir. 1995); *In re Margolis*, 785 F.2d 1029, 228 USPQ 940 (Fed. Cir. 1986). The Examiner's attention is again invited to Tables 1, 3 and 4. It is apparent from Tables 3 and 4 that the rolling fatigue life and foreign matter rolling life at 200°C of steels containing nickel are clearly **unexpectedly and dramatically superior** to those that do not contain nickel. That this is unexpected is underscored by the fact that the Examiner has **not** pointed to a shred of objective evidence upon which to conclude that one having ordinary skill in the art would have recognized that the steel disclosed by Takata et al., or the steel disclosed by Ochi et al., or some phantom steel resulting from blending alloying elements from these steels, is suitable for high temperature bearing use.

Further, it should be apparent from Tables 1 and 3 that elements such as nickel, sulfur, phosphorous, maganese, carbon, molybdenum, vanadium as well as trace amounts of aluminum, titanium, oxygen and nitrogen affect the temper hardness and rolling contact fatigue life. Such evidence further scotches any notion that somehow the combined disclosures of Takata et al. and Ochi et al. would result in a steel which

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necessarily, repeat necessarily, exhibits a hardness after tempering at a temperature of 180°C to about 350°C of at least HRC 58 or a maximum carbide size not greater than 8 μm .

Another potent indicum of **nonobviousness**, which the Examiner persists in erroneously ignoring, is the problem addressed and solved by the claimed invention which must be given consideration anent the **nonobviousness** issue. *North American Vaccine, Inc. v. American Cyanamid Co.*, 7 F.3d 1571, 28 USPQ2d 1333 (Fed. Cir. 1993); *Northern Telecom, Inc. v. Datapoint Corp.*, 908 F.2d 931, 15 USPQ2d 1321 (Fed. Cir. 1990); *In re Newell*, *supra*; *In re Nomiya*, 509 F.2d 566, 184 USPQ 607 (CCPA 1975. As argued throughout prosecution of this application, the present invention addresses and solves problems with bearings at high temperatures. As Takata et al. and Ochi et al. neither disclose nor suggest bearings for **high temperature service**, the problems addressed and solved by the claimed invention are **alien to these references**.

Specifically, high temperature tempering is performed to ensure dimensional stability. However, high temperature tempering disadvantageously generates problems, such as lower hardness and shortening of bearing life. Again, these problems do not even exist or are addressed by Takata et al. or Ochi et al. However, in accordance with the present invention, such problems are addressed and solved by strategically formulating the steel composition and employing certain processing conditions, thereby enabling the manufacturer of a high temperature bearing part exhibiting higher dimensional stability and sufficient hardness. In other words, the claimed invention achieves a combination of conflicting objectives which are not even on the radar screen of Takata et al. or Ochi et

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al. Under such circumstances, the problem addressed and solved by the claimed invention constitutes **compelling objective evidence of nonobviousness**.

Due Process of Law

One further point should be made. In the third full paragraph on page 3 of the May 21, 2002 Office Action, the Examiner refers to Habrovec et al. This reference has **not** been included in the statement of the rejection. The Examiner's reliance upon such reference is, therefore, procedurally erroneous under due process of law. *In re Hoch*, 428 F.2d 1341, 166 USPQ 406 (CCPA 1970). Suffice to say, the reference to Habrovec et al. does not cured the argued deficiencies in the attempted combination of the actually applied references to Takata et al., Ochi et al., the acknowledged prior art and JIS.

Conclusion

Applicants submit that the Examiner failed to establish a prima facie basis to deny patentability to the claimed invention. The Examiner has **not** provided sufficient facts. The Examiner has **not** established the requisite **motivation**. *In re Lee, supra*. Assumptions and generalities do **not** suffice. *In re Lee, supra*. Further, the Examiner's reliance upon the doctrine of inherency lacks the requisite certainty and confuses obviousness with inherency. The Examiner has also erroneously ignored the **problem** element of the claimed invention which is alien to the applied prior art. The Examiner has further ignored the compelling evidence of **nonobviousness** in the specification, which demonstrated results are not only dramatic but unexpected. Under such circumstances, the conclusion appears inescapable that one having ordinary skill in the

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art would **not** have found the claimed invention as a whole obvious within the meaning of 35 U.S.C. §103. *In re Piasecki*, 745 F.2d 1468, 223 USPQ 785 (Fed. Cir. 1984).

Applicants, therefore, submit that the imposed rejection of claims 1 and 2 under 35 U.S.C. §103 for obviousness predicated upon Takata et al. in view of Ochi et al., the acknowledged prior art and JJS is not factually or legally viable and, hence, solicit withdrawal thereof.

It should, therefore, be apparent that the imposed rejection has been overcome and that all pending claims are in condition for immediate allowance. Favorable consideration is, therefore, respectfully solicited.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,



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APPENDIX

Claim 1 now reads as follows.

- Thrice*
1. (Twice Amended) A part of an antifriction bearing for a high temperature having an inner ring, an outer ring and a rolling element, consisting of a steel product containing C by at least 0.8% and not more than 1.3%, Si by at least 0.3% and not more than 3.0%, Mn by at least 0.2% and not more than 1.5%, P by not more than 0.03%, S by not more than 0.03%, Cr by at least 0.3% and not more than 5.0%, Ni by at least 0.53% and not more than 3.0%, Al by not more than 0.050%, Ti by not more than 0.003%, O by not more 0.0015% and N by not more than 0.015% in mass % as the contents of alloying elements with the rest consisting of Fe and unavoidable impurities and having a structure subjected to tempering after quench hardening or carbonitriding, wherein the hardness after said tempering is at least HRC 58, when tempered at a temperature in a range of 180°C to 350°C, and the maximum carbide size is not more than 8 μ m.